

Microsphere-Based Osteochondral Scaffolds Carrying Opposing Gradients Of Decellularized Cartilage And Demineralized Bone Matrix

*Vineet Gupta¹, Dina V. Lyne², Amy D. Laflin², Taylor A. Zabel³, Marilyn Barragan³, Joshua T.
Bunch⁴, Donna M. Pacicca^{5, 6}, and Michael S. Detamore^{*1, 2}*

¹Bioengineering Graduate Program, University of Kansas, Lawrence, Kansas

* Department of Chemical and Petroleum Engineering

The University of Kansas

4149 Learned Hall

1530 W. 15th Street

Lawrence, KS 66045-7618

Phone: (785) 864-4943

FAX: (785) 864-4967

Email: detamore@ku.edu

²Department of Chemical and Petroleum Engineering, University of Kansas, Lawrence, Kansas

³Department of Molecular Biosciences, University of Kansas, Lawrence, Kansas

⁴Department of Orthopaedic Surgery, University of Kansas Medical Center, Kansas City, Kansas

⁵Division of Orthopaedic Surgery, Children's Mercy Hospital, Kansas City, Missouri

⁶School of Medicine, University of Missouri-Kansas City, Kansas City, Missouri

SUPPORTING INFORMATION

Figure S1. Implant placed in a defect in the medial femoral condyle (photo shows right knee). Immediately after being placed into the defect, the implant was infiltrated by marrow.

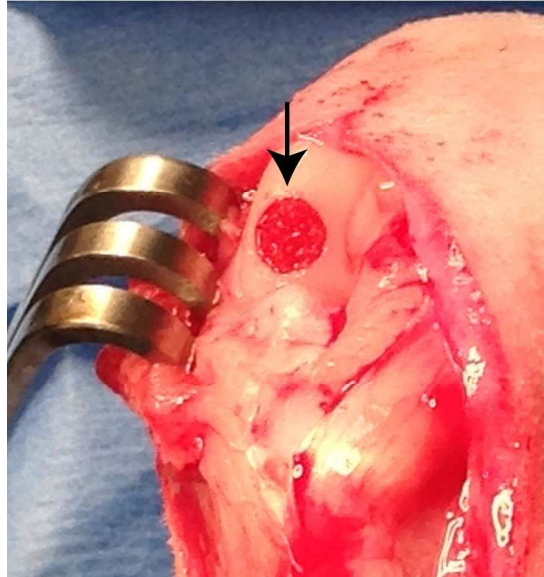


Figure S2. Histological and immunohistochemical (IHC) staining images for the BLANK implant along with their histological scores on top. First column represents images from the implant that received the highest histological score (10.2); second column represents images from the implant that received the highest histological score (10.2); second column represents images from the implant that received the second highest histological score (7.3); third column represents images from the implant that received the second highest histological score (7.3); third column represents images from the implant that received the third highest histological score (6.7); and fourth column represents images from the implant that received the lowest score (6.0) in the BLANK group. The sections were stained for hematoxylin and eosin; safranin-O; collagen I; and collagen II. Negative controls for IHC were also run with the primary antibody omitted. The boxes in the top row outline the defect area. The regenerated tissue in the BLANK group was predominantly fibrous in nature with some evidence of cartilage repair and subchondral bone regeneration especially at the edges of the defect site. Scale bars: 500 μ m.

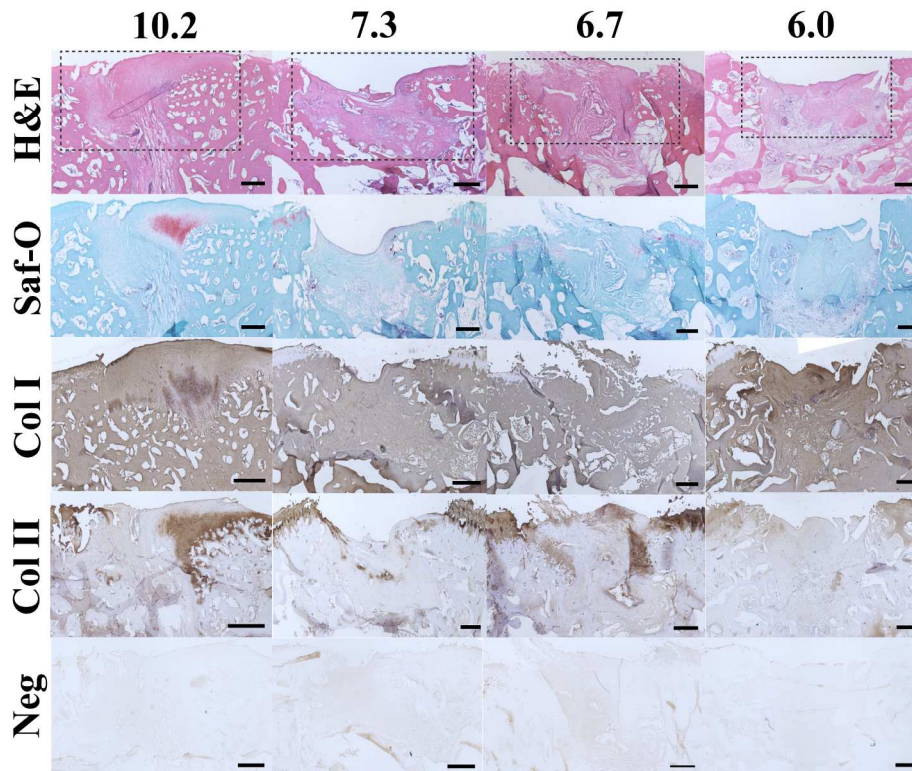


Figure S3. Histological and immunohistochemical (IHC) staining images for the GRADIENT implants along with their histological scores on top. First column represents images from the implant that received the highest histological score (8.7); second column represents images from the implant that received the highest histological score (8.7); second column represents images from the implant that received the second highest histological score (8.0); third column represents images from the implant that received the third highest histological score (6.7); and fourth column represents images from the implant that received the lowest score (6.0) in the GRADIENT group. The sections were stained for hematoxylin and eosin; safranin-O; collagen I; and collagen II. Negative controls for IHC were also run with the primary antibody omitted. The boxes in the top row outline the defect area. The repair tissue was predominantly fibrous in nature with some evidence of cartilage repair. The subchondral bone region consisted of void areas with minimal bone regeneration. Scale bars: 500 μ m.

